distance of one or more letters of the word, or when the path passes within a threshold distance of one or more letters of the word in a sequence other than the sequence of the letters in the correct spelling of the word.

[0017] The keyboard may be displayed on a touch-sensitive display screen (hereinafter referred to as a touch-screen) and the user contacts the display by means of a stylus. It should be understood, however, that the system can be applied to any system where the user can trace out a continuous path on a displayed keyboard, for example, a touch-sensitive screen that is contacted with the user's finger, or even a standard computer display monitor (not a touch-sensitive screen) where the point of "contact" is the location of an on-screen cursor whose location on the display is controlled by a mouse (or equivalent positional control device) and where the acts of "contacting" and "breaking contact with" the screen are indicated by closing and opening a switch (or performing some other equivalent control action, such as "dwelling" near a location without moving the mouse for a period of time longer than a selected threshold). In another embodiment, the beginning and end of each input path is indicated gesturally as a feature of each input path, for example, by starting with the displayed cursor above the area defined by the displayed keyboard, and moving the cursor down into the keyboard area to the vicinity of the first letter of an intended word to begin an input path, then moving the cursor back up above the keyboard area once the cursor has been moved to the vicinity of the final key of the intended word. Other approaches include the use of other positional control devices such as joysticks, eye-gaze control systems, etc., to control the movement of the displayed cursor over the keyboard.

[0018] The operation of the system will be described with reference to an aspect comprising a touch-screen contacted by a stylus, but this should not be construed as limiting the scope of the invention, but simply as a means to provide illustrations of some of the present aspects of this method. The method simply processes a user-generated stream of location data, which begin at a known point (in the touch-screen model, the point where the stylus first contacts the screen), proceed through a sequence of two-dimensional data point locations which have a known relationship to a defined virtual keyboard area in the same two-dimensional space (in the touch-screen model, the sequence of points detected where the stylus is moved while in contact with the screen), and which end at a known point (in the touch-screen model, the point where the stylus last contacts the screen). In certain embodiments, the times when the data points are generated, or equivalently for these embodiments, the time intervals between the data points, are also processed, and can also be provided by various equivalent technologies.

[0019] The term "letter" in the context of the present invention is to be understood to include any character that appears in the spelling of one or more words of the database. The term "word" in the context of the present invention is to be understood to include any sequence of characters that is stored in the database that can be matched against an input path and output as text. Thus, for example, if the word "can't" is among the words in the database of the system, it is possible to enter the word by tracing out a path that starts near the letter "c," passes through or near the letters "a" and "n," then through or near the key associated with the apostrophe, and ends near the letter "t." Similarly, hyphen-

ated words, alphanumeric words, and other words containing special characters can all be included in the database and entered as text using the system of the present invention, providing that each of the characters used in the database is associated with at least one key on the keyboard. Alternatively, in another embodiment, words such as "can't" may be entered without tracing the path through or near the key associated with the apostrophe, since there has been an observed tendency for some users to enter such words in that fashion.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020] Preferred and alternative embodiments of the present invention are described in detail below with reference to the following drawings:

[0021] FIG. 1 is a hardware block diagram showing the typical hardware components of a system which embodies the method of the present invention such as that shown in FIGS. 2A through 2E;

[0022] FIG. 2A is a schematic view of an embodiment of a portable computer with a touch-screen display on which a keyboard system of the present invention is displayed;

[0023] FIG. 2B is the same view showing an embodiment of a word selection list displayed after a user has completed tracing out an input path and has lifted the stylus from the touch-screen;

[0024] FIG. 2C is the same view showing an embodiment of an alternate letter form pop-up selection list displayed after a user has touched the stylus on the "e" key, and maintained contact with the key past a predetermined time threshold;

[0025] FIG. 2D is the same view showing the result of activating an embodiment of the "Re-Edit" function that assists the user in correcting a previously output word when the user failed to select the intended word from the word selection list;

[0026] FIG. 2E shows the same view, showing a word selection list displayed after a user has completed tracing out an input path very similar to that shown in FIG. 2B;

[0027] FIGS. 3A through 3J show an embodiment of a software algorithm to implement the method of the present invention in order to determine the most likely word or words in a database that match an input path traced out by a user;

[0028] FIGS. 4A-C show a portable computer with a touch-screen display that depicts a possible input path for the same intended word ("pout");

[0029] FIG. 5 shows a portable computer with a touch-screen display that depicts an input path corresponding to an embodiment of a shift gesture;

[0030] FIG. 6 shows a portable computer with a touch-screen display that depicts an input path which has caused the system to display an embodiment of a visual feedback feature; and

[0031] FIGS. 7A and 7B show a portable computer with a touch-screen display that depicts an input path which has caused the system to display an embodiment of another visual feedback feature and an embodiment of a selection list sorting algorithm.